



Cardiac Inherited Disease Group (CIDG) Cardiac Inherited Disease Registry N.Z.

Cardiac Inherited Disease Registry
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The following drugs have been associated with the typical (type-1) Brugada syndrome ECG. However, there is (yet) no substantial evidence that these drugs can, in addition to the ECG phenotype, also cause malignant arrhythmias. Furthermore, we listed drugs for which there is only experimental evidence (*in-vivo* or *in-vitro*) that suggests a possible deleterious effect in Brugada syndrome. Nevertheless, it should be considered to advise patients with Brugada syndrome to avoid these drugs or to use these drugs only after extensive consideration and/or in controlled conditions.

If you are currently taking a medication that is on this list it is important to discuss it's use at the earliest possible opportunity with your Cardiologist/Specialist; please contact the CIDG co-ordinator if you require assistance. Do not stop taking prescribed medications without first discussing this with your Doctor. Information is current as of 08/11/2011. Please note these lists will be updated as new medications are added to the list of avoided medications. If you are not sure if a certain drug may cause a problem please check with your Specialist; if you are collecting a script from your G.P. check with the pharmacist at the chemist when you take the script to be filled. Some of the drugs on the list have the American generic name and occasionally drugs will be called something different in N.Z. if you are not sure please ask. Website address is: www.brugadadrugs.org

It is particularly important to avoid all illicit drugs, party pills, high dose caffeine (Red Bull and V drinks in large quantities and mixed with other compounds and or alcohol) and unknown supplements (Chinese herbal medicines) and starvation type diets in the setting of both Brugada syndrome and Long QT syndrome (since SCN5A gene is implicated in both conditions). CIDG strongly advise against taking any non prescribed medications without medical advice.

Antiarrhythmic drugs

(Alphabetical order generic name)

Generic name	Brand name®	Class / Clinical use	References	Recommendation
Ajmaline	e.g. Gilurytmal®	Antiarrhythmic Agent (1A: Na-blocker) / Arrhythmias	Brugada et al. 1997 Rolf et al. 2003 Wolpert et al. 2005 Bébarová et al. 2005	Class I
Flecainide	e.g. Tambacor®	Antiarrhythmic Agent (1C: Na-blocker) / Arrhythmias	Krishnan et al. 1998 Brugada et al. 2000 Gasparini et al. 2003 Meregalli et al. 2006 Stokoe et al. 2007	Class I
Pilsicainide	e.g. Sunrhythm®	Antiarrhythmic Agent (1C: Na-blocker) / Arrhythmias	Takenaka et al. 1999 Fujiki et al. 1999 Takagi et al. 2002 Kimura et al. 2004	Class I
Procainamide	e.g. Procan® Pronestyl®	Antiarrhythmic Agent (1A: Na-blocker) / Arrhythmias	Miyazaki et al. 1996 Brugada et al. 1997 Joshi et al. 2007 Villemaire et al. 1992	Class I
Propafenone	e.g. Rythmol®	Antiarrhythmic Agent (1C: Na-blocker) / Arrhythmias	Matana et al. 2000 Akdemir et al. 2002 Hasdemir et al. 2006 Shan et al. 2008	Class IIa

Recommendation: Class I: convincing evidence/opinion; Class IIa: evidence/opinion less clear; Class IIb: conflicting evidence/opinion; Class III: very little evidence.

Sychotropic drugs

(Alphabetical order generic name)

Generic name	Brand name®	Class / Clinical use	References	Recommendation
Amitriptyline	e.g. Elavil® Sarotex® Tryptizol®	Antidepressive Agent, Tricyclic	Bolognesi et al. 1997 Rouleau et al. 2001 Bebarta et al. 2007 Nau et al. 2000	Class IIa
Clomipramine	e.g. Anafranil® Anafriol®	Antidepressive Agent, Tricyclic	Goldgran et al. 2002 Pacher et al. 2000	Class IIa
Desipramine	e.g. Norpramin® Pentofran®	Antidepressive Agent, Tricyclic	Babaliarios et al. 2002 Chow et al. 2005 Akhtar et al. 2006 Sudoh et al. 2003	Class IIa
Lithium	e.g. Eskalith®	Antidepressive Agent	Babalarios et al 2002 Darbar et al. 2005	Class IIb
Loxapine	e.g. Cloxazepine® Loxitane®	Antipsychotic Agent	Rouleau et al. 2001 Kinugawa et al. 1988	Class IIa
Nortriptyline	e.g. Nortrilen® Pamelor®	Antidepressive Agent, Tricyclic	Tada et al. 2001 Muir et al. 1982 Sudoh et al. 2003	Class IIa
Oxcarbazepine*	e.g. Trileptal®	Anti-epileptic Agent	El-Menyar et al. 2011 Huang et al. 2008	Class IIa
Trifluoperazine	e.g. Fluoperazine® Stelazine®	Antipsychotic Agent, Phenothiazine	Rouleau et al. 2001 Klöckner et al. 1987	Class IIa

Recommendation: Class I: convincing evidence/opinion; Class IIa: evidence/opinion less clear; Class IIb: conflicting evidence/opinion; Class III: very little evidence.

*Oxcarbazepine is structurally a derivative of carbamazepine which is on the [preferably avoid list](#).

Anesthetics / analgesics

(Alphabetical order generic name)

Generic name	Brand name®	Class / Clinical use	References	Recommendation
Bupivacaine	e.g. Marcaine® Sensorcaine®	Anesthetic / analgesic agent	Phillips et al. 2003 Vernooy et al. 2006 Bramall et al. 2011 De la Coussaye et al. 1992 Berman et al. 1994	Class IIa
Propofol	e.g. Diprivan®	Anesthetic Agent	Inamura et al. 2006 Vernooy et al. 2006 Robinson et al. 2008 Saint 1998	Class IIb

Recommendation: Class I: convincing evidence/opinion; Class IIa: evidence/opinion less clear; Class IIb: conflicting evidence/opinion; Class III: very little evidence.

Other substances

(Alphabetical order generic name)

Generic name	Brand name®	Class / Clinical use	References	Recommendation
Acetylcholine	-	Cholinergic Agent / Vasospastic intracoronary	Miyazaki et al. 1996 Noda et al. 2002 Montgomery et al. 1974	Class IIa
Alcohol (toxicity)	-Not applicable-	Other substances / Anesthetic Agent	Shimada et al. 1996 Rouleau et al. 2001 Habuchi et al. 1995	Class IIb
Cocaine	-Not applicable-	Other substances / Anesthetic Agent	Littmann et al. 2000 Ortega et al. 2001 Bebarta et al. 2007 Xu et al. 1994	Class IIa
Ergonovine	e.g. Ergotrate®	Vasospastic intracoronary	Noda et al. 2002 Müller et al. 1980	Class IIb

Recommendation: Class I: convincing evidence/opinion; Class IIa: evidence/opinion less clear; Class IIb: conflicting evidence/opinion; Class III: very little evidence.

Drugs preferably avoided by Brugada syndrome patients

Antiarrhythmic drugs

(Alphabetical order generic name)

Generic name	Brand name®	Class / Clinical use	References	Recommendation
Amiodarone	e.g. Cordarone®	Antiarrhythmic Agent (3 – also 1A, 2, and 4 effects) / Arrhythmias	Chalvidan et al. 2000 Paul et al. 2006 Wu et al. 2008	Class IIb
Cibenzoline	e.g. Cipralan®	Antiarrhythmic Agent (1A: Na-blocker) / Arrhythmias	Tada et al. 2000 Sarkozy et al. 2005 Niwa et al. 1998	Class IIb
Disopyramide	e.g. Dicorantil® Norpace® Ritmoforine®	Antiarrhythmic Agent (1A: Na-blocker) / Arrhythmias	Miyazaki et al. 1996 Chinushi et al. 1997 Shimizu et al. 2000 Sugao et al. 2005 Sumi et al. 2009 Grant et al. 2000	Class IIb
Lidocaine *	e.g. Xylocaine®	Antiarrhythmic Agent (1A: Na-blocker) / Arrhythmias	Miyazaki et al. 1996 Barajas et al. 2008	Class IIb
Propranolol	e.g. Inderal®	Antiarrhythmic Agent (2: B-blocker) / Arrhythmias	Miyazaki et al. 1996 Shimada et al. 1996 Kasanuki et al. 1997 Aouate et al. 2005 Shimada et al. 1999	Class IIb
Verapamil	e.g. Calan® Covera® Isoptin® Verelan®	Antiarrhythmic Agent (4: Ca-blocker) / Arrhythmias	Miyazaki et al. 1996 Chinushi et al. 2006 Fish et al. 2008	Class IIb

Recommendation: Class I: convincing evidence/opinion; Class IIa: evidence/opinion less clear; Class IIb: conflicting evidence/opinion; Class III: very little evidence.

* **Lidocaine use for local anesthesia (e.g. by dentists) does seem to be safe when combined with adrenaline/epinephrine (e.g. xylocaine dental/epinephrine or articaïne/epinefrine (Ultracain® or Septanest®) 1:100000) and the amount administrated is low as it results in a local effect only.**

Psychotropic drugs

(Alphabetical order generic name)

Generic name	Brand name®	Class / Clinical use	References	Recommendation
Carbamazepine	e.g. Carbatrol® Tegretol®	Anticonvulsant Agent	Megarbane et al. 2006 Bräu et al. 2001	Class IIb
Cyamemazine	e.g. Cianatil®	Antidepressive Agent, Phenothiazine	Rouleau et al. 2001 Crumb et al. 2006	Class IIb
Dosulepine	e.g. Prothiaden®	Antidepressive Agent, Tricyclic	Meert et al. 2009	Class IIb
Doxepin	e.g. Sinequan® Triadapin® Zonalon®	Antidepressive Agent, Tricyclic	Bebarta et al. 2007 Muir et al. 1982	Class IIb
Fluoxetine	e.g. Prozac® Sarafem®	Antidepressive Agent, SSRI	Rouleau et al. 2001 Pacher et al. 2000	Class IIb
Fluvoxamine	e.g. Fevarin® Luvox®	Antidepressive Agent, SSRI	Stirnemann et al. 2009	Class IIb
Imipramine	e.g. Declomipramine® Norfranil® Tofranil®	Antidepressive Agent, Tricyclic	Robert et al. 1996	Class IIb
Maprotiline	e.g. Deprilept®	Antidepressive Agent, Tetracyclic	Bolognesi et al. 1997 Igawa et al. 1988	Class IIb
Perphenazine	e.g. Perphenan®	Antidepressive Agent, Phenothiazine	Bolognesi et al. 1997 Bébarová et al. 2009	Class IIb
Phenytoin	e.g. Dilantin® Diphantoine® Epanutin®	Anticonvulsant and Antiarrhythmic Agent	Al Aloul et al. 2007 Xu et al. 1991	Class IIb
Thioridazine	e.g. Mellaril® Ridazine®	Antipsychotic Agent	Copetti et al. 2005	Class IIb

Recommendation: Class I: convincing evidence/opinion; Class IIa: evidence/opinion less clear; Class IIb: conflicting evidence/opinion; Class III: very little evidence..

Anaesthetics / analgesics

(Alphabetical order generic name)

Generic name	Brand name®	Class / Clinical use	References	Recommendation
Ketamine	e.g. Esketamine® Ketanest®	Anesthetic Agent	Rollin et al. 2011 Hara et al. 1998	Class IIb
Tramadol	e.g. Ryzolt® Tramal® Zydol®	Narcotic analgesic	Cole et al. 2010 Haeseler et al. 2006	Class IIb

Recommendation: Class I: convincing evidence/opinion; Class IIa: evidence/opinion less clear; Class IIb: conflicting evidence/opinion; Class III: very little evidence.

Other substances

(Alphabetical order generic name)

Generic name	Brand name®	Class / Clinical use	References	Recommendation
Dimenhydrinate	e.g. Permital®	Antiemetic Agent/ Histamine H ₁ antagonist	Pastor et al. 2001 Kuo et al. 2000	Class IIb
Diphenhydramine	e.g. Benadryl® Dimedrol®	Histamine H ₁ antagonist	Lopez et al. 2005 Kuo et al. 2000	Class IIb
Edrophonium	e.g. Enlon® Tensilon®	Cholinergic Agent	Miyazaki et al. 1996 Kasanuki et al. 1997	Class IIb
Indapamide	e.g. Idapamide® Lozol®	Diuretic Agent/Hypertension	Mok et al. 2008	Class IIb
Terfenadine/ Fexofenadine	e.g. Seldane® Teldane® Allegra®	Antihistamine	Matsuki et al. 2009 DiDiego et al. 2002	Class IIb

Recommendation: Class I: convincing evidence/opinion; Class IIa: evidence/opinion less clear; Class IIb: conflicting evidence/opinion; Class III: very little evidence..

Anti-anginal drugs

(Alphabetical order generic name)

Generic name	Brand name®	Class / Clinical use	References	Recommendation
Diltiazem	e.g. Tildiem®	Vasodilator Agent (Ca-blocker) / Hypertension, vasospasms	Itoh et al. 1999 Sasaki et al. 2006 Antzelevitch et al. 2005 Miyazaki et al. 1996	Class III
Nicorandil	e.g. Ikorel®	Vasodilator Agent (K-agonist / NO-donor) / Angina pectoris	Antzelevitch et al. 2005 Robert et al. 1999	Class III
Nifedipine	e.g. Adalat®	Vasodilator Agent (Ca-blocker) / Angina pectoris, hypertension	Antzelevitch et al. 2005 Hussain et al. 1997	Class III
Nitroglycerine	e.g. Nitrospan® Tridil®	Vasodilator Agent (NO donor) / Angina pectoris	Matsuo et al. 1998 Antzelevitch et al. 2005 Korth. 1975	Class III
Sorbidnitrate	e.g. Cedocard® Isordil®	Vasodilator Agent (NO donor) / Angina pectoris	Chinushi et al. 2006 Antzelevitch et al. 2005 Atanassova et al. 1992	Class III

Recommendation: Class I: convincing evidence/opinion; Class IIa: evidence/opinion less clear; Class IIb: conflicting evidence/opinion; Class III: very little evidence.

Disclaimer and Waiver

The information presented is intended solely for the purpose of providing general information about health related matters. We do our best to ascertain that all information on this site is correct and up-to-date. However, we cannot guarantee that it is. The information provided here is for educational and informational purposes only and designed primarily for use by qualified physicians and other medical professionals. It is not intended for any other purpose, including, but not limited to, medical or pharmaceutical advice and/or treatment, nor is it intended to substitute for the users' relationships with their own health care/pharmaceutical providers. To that extent, by continued use of this program, the user affirms the understanding of the purpose and releases the Academic Medical Center, the BrugadaDrugs.org Advisory Board and Cardionetworks from any claims arising out of his/her use of the website.

Principal limitation

It should be clear to the users of this site that the principal limitation of the association between certain drugs, Brugada syndrome and arrhythmias, is that there are quite often only (a number of) case reports and experimental studies suggesting an effect in Brugada syndrome. Further, there may be conflicting results and there may be large variability for Brugada syndrome patients in their response to certain drugs. This response may also differ in different conditions (e.g. with or without fever, drug in therapeutic range, overdosed or in combination with other drugs etc.). Clinical decision making should be based on more than the presence or absence of a (single) association in another patient

Notes about the lists:

- On this list we summarized those drugs for which there is a possible association noted in the literature between the drug and the Brugada syndrome.
- Drugs are listed with up to 4 common brand names. There are several brand names for many of the drugs, which are not all listed. It is also important to look at the active drugs in medicines that contain a combination of drugs.
- Lists contain links to [DrugBank](#) or [PubChem](#) (click on the drug name) and also (several) [PubMed](#) links to articles on the association between the drug and Brugada syndrome (click on the reference).
- **Please cite this site as:** Postema PG, Wolpert C, Amin AS, Probst V, Borggrefe M, Roden DM, Priori SG, Tan HL, Hiraoka M, Brugada J, Wilde AA. Drugs and Brugada syndrome patients: review of the literature, recommendations and an up-to-date website (www.brugadadrugs.org). *Heart Rhythm* 2009; 6(9):1335-1341. (Free available from [Heart Rhythm](#), PubMed link [here](#)).
- Lists contain a classifying column '**Recommendation**' in which the available evidence from the literature and the expert opinion of the [BrugadaDrugs.org Advisory Board](#) is described. Please note that there are no randomized clinical studies in Brugada syndrome patients, therefore the
- Level of evidence is mostly C (only consensus opinion of experts, case studies, or standard-of-care) and for some B (non-randomized studies).
 - **Class I:** There is evidence and/or general agreement that a given drug is potentially arrhythmic in Brugada syndrome patients.
 - **Class IIa:** There is conflicting evidence and/or divergence of opinion about the drug, but the weight of evidence/opinion is in favor of a potentially arrhythmic effect in Brugada syndrome patients.
 - **Class IIb:** There is conflicting evidence and/or divergence of opinion about the drug, and the potential arrhythmic effect in Brugada syndrome patients is less well established by evidence/opinion.
 - **Class III:** There is no or very little evidence and/or general agreement that a drug is potentially arrhythmic in Brugada syndrome patients

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